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# A National Study of Traumatic Brain Injury and Wheel-Related Sports

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INTRODUCTION

Traumatic brain injury (TBI) is the leading killer and disabler of children. Each year, 3,000 children are killed and approximately 29,000 are hospitalized due to TBI.<sup>1</sup> The most important organ in the body, the brain is also one of the most fragile. Although the skull provides some natural protection, even a mild jolt to the head can result in bruising of the brain and tearing of nerves and blood vessels. Damaged brain cells do not heal like broken bones or torn muscles. When the child survives, consequences of TBI such as paralysis, severe amnesia, slurred speech, depression and anxiety, and loss of motor skills can last a lifetime.

Unfortunately, many parents underestimate the risks of children sustaining a brain injury while riding on wheels. Nearly 28 million children ages 5 to 14 ride bikes, and the popularity of scooters, skates, skateboards and other wheeled sports has skyrocketed. Each year thousands of these kids are disabled or die as a result of a wheel-related brain injury. In fact, a fall from as little as 2 feet can result in a TBI.<sup>2</sup>

A helmet is the simplest, most cost-effective way to prevent wheel-related TBI. Helmets can reduce the risk of brain injury by as much as 88 percent.<sup>3</sup> Unfortunately, it is estimated that only 15 to 25 percent of kids wear helmets.<sup>4,5</sup> The National SAFE KIDS Campaign sought to contribute to the field of injury prevention by creating a better understanding of wheel-related brain injury and the necessity of helmet use. To do so, SAFE KIDS conducted a two-part study exploring the incidence of and the attitudes, behaviors and consequences related to traumatic brain injury.

Due to the availability of data on bike-related injuries, SAFE KIDS first analyzed national trauma data with the following questions in mind: What percentage of children seriously injured in a bike crash are diagnosed with a TBI? Are children of a certain age more likely to suffer a TBI? To learn more about kids’ behaviors when riding all wheeled sports, SAFE KIDS commissioned a national survey of “tweens” to find out: How much do kids know about brain injury? How often do they wear their helmets? If they are not wearing them, why not?



STUDY METHODOLOGY

TRAUMA REGISTRY DATA

Data for this analysis were obtained from the National Pediatric Trauma Registry (NPTR), which compiles records of children and adolescents treated at more than 80 trauma centers across the United States. Participation in and reporting to the NPTR are voluntary. The results are based on 3,675 children ages 14 and under admitted to hospitals with bicycle-related injuries from June 1994 to September 2001. Data on injuries from other wheeled sports are not specifically coded and were therefore not included in the analysis. TBI was defined as having one of the following ICD-9 CM codes in one of the first eight diagnosis fields: 800.0-801.9, 803.0-804.9, 850.0-854.1. Data were analyzed using SPSS version 8.0 statistical software.

YOUTH SURVEY DATA

To learn more, focus groups were conducted with “tweens” (kids ages 8 to 12) and teachers to explore kids’ knowledge of traumatic brain injury and their attitudes toward helmets. Focus group findings were used to create questions and response categories for a national survey of “tweens.” Survey data were collected as part of a monthly omnibus survey conducted by Harris Interactive<sup>SM</sup> in February 2002. Results are based on the responses of 332 children ages 8 to 12 and are representative of all U.S. children in this age group.

Experts from the Brain Injury Association, Think First National Injury Prevention Foundation, the TBI Technical Assistance Center at Children’s National Medical Center, and the Centers for Disease Control and Prevention served on the study’s technical advisory committee and assisted with data interpretation and survey questions.

***“A helmet is the simplest, most cost-effective way to prevent wheel-related TBI. Helmets can reduce the risk of brain injury by as much as 88 percent.”***





## STUDY RESULTS

### DATA

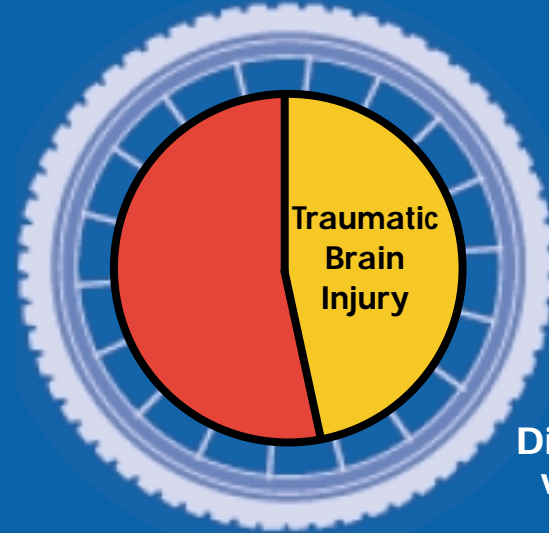
- ✦ Nearly half (47 percent) of the children ages 14 and under who were hospitalized for bike-related injuries were diagnosed with a TBI.
- ✦ Nearly 51 percent of the children ages 10 to 14 were diagnosed with a TBI, compared to only 44 percent of the children ages 5 to 9 and 38 percent of the children ages 4 and under.
- ✦ More than 56 percent of the children who were hit by a motor vehicle suffered a TBI, compared to only 45 percent of the children who collided with a stationary object.
- ✦ Males accounted for nearly three-fourths of the hospital admissions for both TBI and bike-related injuries.

### SURVEY RESULTS

- ✦ Ninety-four percent of children ages 8 to 12 have biked in the last year. In addition, 75 percent of children have skated and 73 percent have ridden on scooters.
- ✦ While more than three-quarters of children said that a brain injury could occur while riding on wheels and 65 percent of kids knew that the effects of a brain injury could last a lifetime, less than half said they wear their helmet on every bike ride, and less than a third always wear their helmets while riding scooters, skateboards or skates.
- ✦ Nearly half of children reported that they “only ride near home” as a reason for not always wearing a helmet. Other popular reasons included: “Helmets are uncomfortable” (43 percent); “I am older now and in more control when I ride” (29 percent); “I don’t feel cool wearing a helmet” (28 percent); “My parents don’t make me” (27 percent); and “I don’t think I need to wear a helmet for all of these activities” (32 percent).
- ✦ More than half of children said that “parents having a rule that [I] always had to wear a helmet” would get them to wear a helmet. Other compelling reasons included: “knowing someone who was badly hurt because they didn’t wear a helmet” (54 percent); a “law in [my] community or state” (49 percent); and a “more comfortable helmet” (47 percent).
- ✦ Children do not perceive themselves as being susceptible to a brain injury. While 30 percent thought it was unlikely that someone they know could suffer a head or brain injury when riding on wheels, 63 percent thought it was unlikely that they themselves could suffer a head or brain injury while riding on wheels.

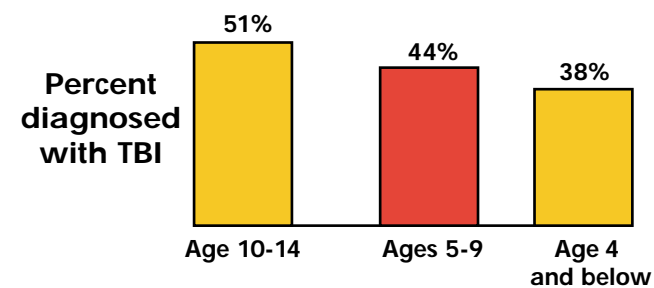


### Children ages 14 and under hospitalized for bike injuries

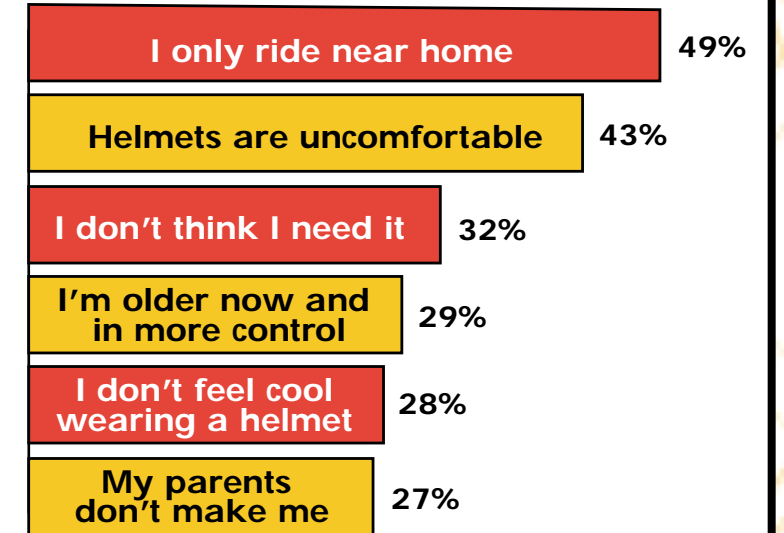


47%  
Diagnosed  
with TBI

### Children sustaining bike-related TBI, by age group

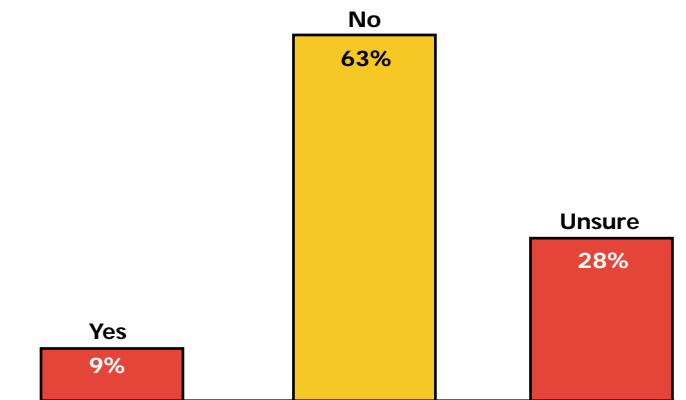


### Why don't you wear a helmet?



Percent of children ages 8-12

### Do you think it is likely that you will hurt your head while riding on wheels?



Percent of children ages 8-12

### What would get you to wear a helmet?



Percent of U.S. children ages 8-12

## CONCLUSION

SAFE KIDS' research indicates that traumatic brain injury (TBI) is a common result of a serious bike crash. Unfortunately, young people underestimate the risks they take in wheeled sports, as indicated by their failure to wear helmets regularly. However, kids themselves report that adults can do more to ensure helmet use among children.

More specifically:

- ✦ Nearly half of severe injuries resulting from bicycle crashes are diagnosed as TBI. This means that, in 2000, more than 4,250 of the estimated 9,000 children ages 14 and under hospitalized for bike-related injuries suffered a TBI – which can have serious long-term effects on quality of life.<sup>6</sup>
- ✦ Older children are more likely to suffer a TBI, most likely because helmet use declines as children age. Estimated helmet use is lowest (for all ages) among children ages 11 to 14 (11 percent).<sup>7</sup>
- ✦ Children mistakenly believe that they don't need to wear helmets when they are riding near home. However, research shows that the typical bike crash occurs within 1 mile of home.<sup>8</sup>
- ✦ Children are more likely to wear their helmets when riding a bike, rather than other wheeled sports. Annually, more than 175,000 children ages 14 and under are treated in emergency rooms for skating, scooter and skateboarding injuries.<sup>9</sup>
- ✦ Children are more likely to wear a helmet if their parents make it a rule in their home.
- ✦ Children would be more likely to wear a helmet if their community or state had a helmet law and/or if they knew someone who was badly hurt because they didn't wear a helmet. Various studies have shown bicycle helmet laws to be effective at increasing bicycle helmet use and reducing bicycle-related death and injury among children covered under the law.<sup>10,11,12,13</sup> However, only 19 states, the District of Columbia and certain localities currently have bike helmet laws, most of which cover only young riders.
- ✦ Most kids believe that since they are skilled riders, a wheel-related crash will not happen to them. However, kids don't consider the role of the car and the driver in many serious wheel-related crashes. It is estimated that collisions with cars account for nearly 90 percent of all bicycle-related deaths and 10 percent of all nonfatal bicycle-related injuries.<sup>14,15</sup>

*“Each year thousands of kids are disabled or die as a result of a wheel-related brain injury.”*



## CALL TO ACTION

To help kids stay safe on wheels, the National SAFE KIDS Campaign and its more than 500 coalitions and chapters will launch a nationwide initiative — *Use Your Head. Wear a Helmet!* — during National SAFE KIDS Week 2002 (May 4-11).

As part of this nationwide initiative, Founding Sponsor Johnson & Johnson and Bell Sports will donate up to \$1,000,000 worth of Bell helmets to kids in need across the nation during the year. In addition, SAFE KIDS coalitions across the country will participate in SAFE KIDS Week by hosting thousands of family safety fairs, bicycle rodeos and other community events. Parents, caregivers and kids will have the opportunity to learn about key risks to children through hands-on training, helmet fitting, interactive displays and activities.

During National SAFE KIDS Week and throughout the year, SAFE KIDS coalitions join many other public health education and advocacy organizations in a multifaceted approach to reducing TBI among children participating in wheel-related sports, by:

- ✦ Educating parents, caregivers and children about the risks and consequences of TBI.
- ✦ Teaching parents, caregivers and children about the importance of selecting appropriate safety gear, including a comfortable, well-fitting helmet, for all wheel-related sports.
- ✦ Encouraging parents and caregivers to set rules that kids must wear helmets on every ride.
- ✦ Inspiring parents, caregivers and older children to be role models by wearing helmets and adopting safe behaviors.
- ✦ Recruiting TBI survivors to participate in school and community programs.
- ✦ Passing bike helmet laws in the remaining 31 states and broadening existing laws to include scooters, skates and skateboards.
- ✦ Improving enforcement and awareness efforts around helmet laws and safety legislation.
- ✦ Advocating for bikeable communities, bike lanes and paths, and traffic-calming measures.
- ✦ Integrating bike safety education and activities into school curricula for all children.
- ✦ Supporting TBI-related research.